STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES
LANSING

RICK SNYDER
GOVERNOR

RODNEY A. STOKES
DIRECTOR

May 4, 2012

Mr. Steve Casey
Michigan Department of Environmental Quality
Water Resources Division
420 Fifth Street
Gwinn, Michigan 49841

Dear Mr. Casey:

This letter provides a review of Department of Environmental Quality (DEQ) Permit 11-52-0075-P submitted by Marquette County Road Commission to construct a 21.4-mile, multi-purpose road in Humboldt Township. The new road, named County Road 595 (CR 595), would open the area to mining, logging, aggregate industries, and public recreational use. The Department of Natural Resources (DNR) has concerns that this road will impact wildlife, forest, and fisheries resources, as well as various recreational activities such as snowmobiling. The DNR also has concerns that the road will present some increased vehicular safety concerns. The DNR believes that many or most of these impacts can be minimized and/or mitigated, provided that the applicant works closely with the DNR and takes appropriate recommended steps.

According to the road commission's application, their stated purpose for CR 595 is to: (1) Connect and improve emergency, commercial, and recreational access to a somewhat isolated but key industrial, commercial and recreational area in northwest Marquette County to US-41, and (2) Reduce truck travel from this area through the county's population centers. The permit application was reviewed by Department of Natural Resources' (DNR) staff within Wildlife, Forest Resources, and Fisheries Divisions.

The applicant analyzed multiple alternative routes for the new road's location. Avoidance and minimization of stream and wetland impacts appear to have been a primary focus during the planning and design phases for both environmental and financial reasons. The selected location, which has its northern terminus on AAA Road approximately one mile east of the Kennecott Eagle mine facility and its southern terminus at the current intersection of County Road FY and US-41 in Humboldt Township.

We recognize the proposed road would provide a number of benefits to society. For example, it would eliminate the need for ore trucks and some logging vehicles to travel on CR 550, CR 510. The road would shorten the distance from state and private forestlands to wood-utilizing mills to the south and west; round-trip travel time would potentially be reduced from three hours to one or less. Improved access into a remote part of Marquette County shortens the distance and response times for some emergency services including DNR firefighters.

Conversely, the proposed road could have negative environmental consequences, including impacts on fish and wildlife habitat, animal populations, and recreational experiences. These potential consequences are discussed in the remainder of this letter.

State Land Affected
If constructed, CR 595 would cross state forestland in two upland areas for approximately 4,500 lineal feet, some of which is already in forest or county roads. These two upland areas were acquired through tax reversion. Easement applications had been filed for these areas in the past when the Woodland Road project was being contemplated. There would be an additional easement required for a 100-foot abandoned railroad grade crossing north of the road's southern terminus. This section of grade was acquired via the rail to trail program with Michigan Natural Resource Trust Fund dollars and will soon be a designated and numbered ORV trail. Any road crossing has its safety concerns but this crossing will be 0.125 mile from a stop sign, so southbound traffic would be preparing for a complete stop and a 90-degree turn, and the northbound traffic would not yet be up to full travel speed as they would have just turned onto CR 595.

Due to the concerns stated above, we recommend the following:

- None at this time.

Snowmobile Trail Impacts
Snowmobile Trail 5 runs north-south through this area before branching east-west toward Big Bay and L'Anse. The proposed CR 595 location would cause 12 miles to be rerouted. A review of the map indicates the new route would follow existing woods roads and approximately one mile of new trail would need to be constructed. The local snowmobile club is investigating permissions for access. The permit for the 0.36 acre of wetlands impacted due to the reroute would fall under the purview of an additional application.

In the past, this snowmobile trail received significant investment of snowmobile program funding for trail construction and maintenance. The snowmobile program should not support costs for a reroute. The proposed snowmobile reroute involves several year-to-year permits with non-corporate landowners which can be revoked at any time. As a result, land control for recreational trail purposes would be less secure, and opportunities to develop a multi-use, multi-season trail would be diminished.

Due to the concerns stated above, we recommend the following:

- Relocation costs of snowmobile trails must be mitigated. The snowmobile program should not support costs for a reroute. An attempt to acquire long-term permits from non-corporate landowners must be made.
- Project activities in wetlands are regulated and require permitting and inspections. Wetland mitigation measures are covered in the permit.

Cultural
In an effort to address cultural concerns, the applicant noted that *according to the URS Corporation Phase I archaeological field survey, the proposed road will not affect any archaeological resources eligible to the National Register for Historic Places.* However, our internal database revealed general archaeological concerns for the following locations: S24 T50N R29W, S2 T49N R29W, S35 T48N R29W, S18 T48N R28W, and S2 T47N R29W. The Office of the State Archaeologist was consulted in regard to specific concerns on the state parcel located in section 18 of T48N R28W, and their reply was that records indicate the site in section 18 is not located on state land, is badly disturbed to the extent that it is not an important site, and does not need to be protected.

Due to the concerns stated above, we recommend that:

- A more in-depth archaeological survey should be conducted on private and corporate lands.

Wildlife-Vehicle Collisions

The proposed CR 595 design speed is 55 mph rather than the 45 mph design speed initially proposed for Woodland Road. In addition, CR 595 includes passing lanes. Higher speeds may increase the risk of property damage accidents, human injury, spills of hauled materials, and wildlife-vehicle collisions. Although traffic strikes may not affect abundant wildlife populations, they may have a significant impact on select populations existing at low numbers such as threatened or endangered species (Glista et al. 2008). Not surprisingly, vehicle-kill has surpassed hunting in vertebrate mortality; in the United States there is an estimated one million vertebrates killed each day (Forman and Alexander, 1998). Roads have been shown to lower the abundance of snakes up to 450 m from road corridors (Rudolph et al. 1999). Road-kill may be a significant factor in the overall decline of amphibian and reptile populations, particularly frogs and other amphibians (Glista et al. 2008). Carpenter and Delzell (1951) observed 873 amphibians while conducting a survey of a 0.9-mile stretch of road in Michigan in which 75 percent were road-killed.

Noss (1996) reported that when interstate highway I-75 was completed through a major deer wintering area in northern Michigan, deer dying from vehicle strikes increased by 500 percent. In 2010 alone there were 360 reported deer-vehicle collisions in Marquette County resulting in ten injuries and damage to 351 vehicles (State of Michigan 2011). Although the proposed CR 595 does not pass through deer wintering complexes, deer in northern Marquette County commonly travel more than 30 miles to reach winter range. Deer tagging studies indicate deer cross the proposed route traveling west-to-east to wintering areas and then east-to-west during spring migration (R. Doepker unpublished data).

Similarly vehicle strike has been shown to be a significant cause of mortality in avian communities (Newton et al. 1991, Bujoczek et al. 2011) and in larger mammals (Bangs et al. 1989, Fuller 1989, B. Roell unpublished data, D. Beyer unpublished data). In a risk analysis for wolf-vehicle collisions in north Marquette County the first recommendation was to avoid increasing roadway density and altering habitat (Hammill 2010). In Michigan, vehicle strikes accounted for 16 percent of radio-collared wolf mortality during 1999–2011 (B. Roell unpublished data). Fuller (1989) found that 11 percent of the wolves killed in his Minnesota study were from vehicle strikes.

The proposed CR 595 will be developed through an area with the highest density of moose in Michigan (Hammill, 2009, Beyer et al. 2009). In the last four years, 33 moose have been killed on Michigan roads, including an all time high of 14 in 2011 (D. Beyer unpublished data). During the last four years, ten (30 percent) of the moose road-kill were adult female moose (Beyer unpublished data). Harvest modeling preformed for the consideration of a moose hunt in Michigan indicated harvesting of cows would not be sustainable due to the small size of the Western Upper Peninsula herd and the disproportionate importance of each female to the reproductive potential of the population (D. Beyer unpublished data). Any potential increase in mortality of adult females could negatively affect the viability of the Michigan moose population. Roads near winter habitat can reduce adult moose survival rates (Bangs et al. 1989), and traffic volume and vehicle speed are important predictors of moose vehicle collisions (Joyce and Mahoney 2001, Seiler 2005). Unlike most forms of natural mortality, vehicle strikes remove individuals from the adult age classes

with the highest survival and reproductive rates (Bangs et al. 1989). Even in birds, these randomly eliminated individuals were found to be in better nutritional condition than conspecifics taken as prey, further illustrating the negative effect vehicle strikes can have on a population (Bujoczek et al. 2011).

Due to the concerns stated above, we recommend the following:

- Post and enforce daytime speed limits not to exceed 45 mph within areas where moose vehicle strikes are a concern (Seiler 2005). Even slower nighttime speed limits should be considered. Areas of concern should be identified in coordination with DNR staff and will be based on areas with concentrated wildlife movement, which may be determined both by existing survey data and future monitoring results.
- Monitor and report vehicle collisions with wildlife to DNR Wildlife Division. This information will be used to determine if additional mitigation solutions are needed.
- Limit and minimize large grassy roadsides that may be attractive wildlife as a food source.
- Minimize any new road construction by upgrading and using existing infrastructure.

Traffic Noise Impacts on Wildlife and Recreationists

Elevated noise level caused by vehicle traffic can extend some distance from the road and may impair the ability of animals to effectively communicate (Van der Zande et al. 1980, Reijnen et al. 1996, Forman and Alexander 1998, Forman et al. 2002, Rheindt 2003, Parris and Schneider 2008, Benítez-López et al. 2010). Noise levels from highway traffic are affected by the volume, speed of the traffic, and the number of trucks in the flow of traffic (South Dakota DOT 2011). The projected average daily traffic for CR 595 is 174 secondary vehicles (mine-related employees, contractors, etc.), 112 ore trucks, and 15 logging trucks. Thus, the amount of traffic noise would likely be substantial. Non-mine related passenger vehicle volume was not estimated.

Many bird species occur at lower densities closer to roads, and bird diversity is often lower in proximity to roads (Forman et al. 2002, Rheindt 2003, Reijnen and Foppen 1995, Reijnen et al. 1995, Reijnen et al. 1996, Parris and Schneider 2008, Clinton et al. 2009, Goodwin and Shriver 2011). Both birds and frogs appear to have lower breeding success near roads (Forman and Alexander 1998, Spellerberg 1998, Bee and Swanson 2007), and road noise may even impact some small mammals by masking alarm calls (Hooper 1994). Acoustic predators such as bats and owls may have their prey detection ability degraded by traffic noise decreasing the suitability of these areas for foraging habitats (Schaub et al. 2008, Siemers and Schaub 2011). This traffic noise effect extends outward for several hundred meters on both sides of highways, even in a forested landscape. The resulting degradation of suitable habitat is much larger than the road right-of-way (Forman et al. 2002). Some studies have shown the negative effects of busy roads can extend up to 1000 m to the sides of the infrastructure (Van der Zande et al. 1980, Reijnen et al. 1995, Forman and Alexander 1998).

The auditory "soundscape" of traffic noise can have a substantial impact on aesthetic and affective assessments of visual landscapes (Anderson et al. 1983, Miller 2002, Benfield et. al. 2010). Traffic noise becomes unwanted when it interferes with normal activities of humans, such as sleep, work, speech, or recreation (South Dakota DOT 2011). The importance of areas where natural sounds can be heard without being interrupted by man-made noise is an ever increasing topic of discussion, prompting Lynch et al. (2011) to write "like scenic vistas, clean air, or pristine bodies of water, natural sounds are considered a precious natural resource worthy of protection." Society is

increasingly expressing concern about preserving natural sounds (Jenson and Thompson 2004) to the point that some outdoor enthusiasts have formed their own organizations or launched websites to combat the intrusion of noise into natural settings (Benfield et. al. 2010).

Due to the concerns stated above, we recommend the following:

- Evaluate new types of pavements that might reduce freeway noise at the source. Such as rubber asphalt open-graded friction course, polymer modified asphalt open-graded friction course or concrete with new types of surface texturing.
- Minimize any new road construction by upgrading and using existing infrastructure.

Increased Human Access - Impacts on Wildlife

Year-round access would open this area to considerably more traffic, reducing some of the area's isolated allure and characteristics. The development of primary roads often leads to an increase in secondary roads creating a network across the landscape (Forman and Alexander 1998). Increasing road access opens formerly remote areas which may elevate poaching and legal hunting (Trombulak 2000). Increased road access may increase the vulnerability of bears, marten, and fisher to hunting and trapping by increasing the efficiency of hunters (Soukkala 1983, Brody and Pelton 1989, Beringer et al. 1990, Hodegeman et al. 1994, Hiller et al. 2011). The marten population is in general decline while the fisher population has declined dramatically since 1996 in the Upper Peninsula and current harvest levels for martens and fisher appears to be unsustainable (Skalski et al. 2011, Skalski et al. in press).

The gray wolf only recently was removed from the federal endangered species list. Higher road densities can provide enough access for humans to limit wolf numbers through legal or illegal trapping or shooting (Thiel 1985, Jensen et al. 1986, Mech et al. 1988, Fuller 1989). Fuller (1989) indicated that despite legal protections, at least 42 percent of wolf mortality in his Minnesota study was caused by illegal take. In Michigan, illegal killing accounted for 41 percent of radio-collared wolf mortality during 1999–2011 (B. Roell, unpublished data).

A report by Trout Unlimited (2006) emphasized the strong connection between successful hunting and fishing and the presence of roadless areas. The habitat security provided by roadless areas facilitates longer hunting seasons and greater numbers of mature bucks and bulls (Pew Environment Group 2011). Sportspersons who hunt northern Marquette County value its remote characteristics and the potential for producing mature white-tailed deer and bear. While the area in which the proposed CR 595 is located is not roadless, existing roads are not regularly maintained and many are for seasonal use only.

Due to the concerns stated above, we recommend the following:

- Minimize any new road construction by upgrading and using existing infrastructure.
- Limit secondary road construction.

Barrier to Wildlife Movement

Research on the effects of roads as barriers to wildlife movement began about 40 years ago (Coffin 2007). Roads are recognized as barriers or filters to some wildlife and potentially disrupt dispersal/movement corridors especially for species that utilize wetlands, such as amphibians, snakes, and turtles (Forman and Alexander 1998, Mazerolle 2004, Glista et al. 2008, Shepard et al. 2008). The long-term effects of roads as barriers can decrease population viability by decreasing genetic diversity between and among populations (Meffe et al. 1994, Marsh et al. 2008, Miller and Evens 2011). Small mammals have been shown to avoid the road surfaces entirely

(McGregor 2008). One researcher found that out of 387 ground squirrels captured in a study area, only one adult male crossed the entire highway (Garland and Bradley 1984). Whether it is a blacktop or dirt, roads are at least partial barriers to the movements of small mammals (Clark et al. 2001). Combine traffic noise, fragmentation, and the microclimate roads can generate (Van der Zande et al. 1980) and the resulting cumulative effect can add up to a significant barrier particularly for birds (Bélisle and St. Clair. 2001). While roads may not be a barrier to large mammalian carnivores such as bears, bobcats, and wolves, the negative relationship between roads and wildlife has been shown to affect their behavior and survival (Mech et al. 1988, Brody and Pelton 1989, Fuller 1989, Beringer et al. 1990, Reynolds-Hogland and Mitchell 2007, Benítez-López et al. 2010, Hammill 2010).

Due to the concerns stated above, we recommend that:

- Steps be taken in consultation with the DNR to minimize/mitigate the impacts of roads on wildlife movements and dispersion.

Fragmentation of Wildlife Habitat

The proposed road is distinctly different from the existing road network in Humboldt Township due to the increase in width, north/south orientation, increase in vehicle speeds, and traffic volume. The proposed CR 595 would be a year-round "multi-use" road accommodating heavy mining traffic, logging operations, and recreational use. The area in which the construction of CR 595 is proposed has some of the lowest road densities in the Northern Great Lakes Region (Saunders et al. 2002). Three of the largest tracts of mature forest in this region occur in this vicinity: McCormick Tract, Craig's Lake Wilderness State Park, and the Huron Mountain Club. Moreover, this geographic area contains the best example of a dry mesic northern forest in the state (Rocking Chair Lakes) and two of the top examples of mesic northern forest statewide. The current condition and spatial arrangement of these sites provide some of the best opportunities within the state for area sensitive wildlife requiring large tracts of mature forest, mesic conifers, and the existence of corridors between such areas.

Fragmentation is an ever-present threat to forest communities in the eastern United States principally driven by land use changes (Ritters et al. 2012). Roads themselves are a major contributor to habitat fragmentation because they divide large landscapes into smaller patches, often creating dispersal barriers and convert interior habitat into edge habitat (Meffe et al. 1994, Noss 1996, Reed et al. 1996, Sunders et al. 2002, Forman and Alexander 1998, Watson 2005, Miller and Evans 2011). The loss and isolation of natural habitats due to fragmentation is one of the greatest threats to biodiversity because long-term population viability for many species is threatened by actions that reduce or prevent normal dispersal (Meffe et al. 1994).

Fragmentation of continuous deciduous forest habitat has been identified as a probable cause of declines in many forest-interior songbird populations (Ambuel and Temple 1982, Temple and Cary 1988). Roads lower the habitat quality decreasing forest bird densities (Ortega and Capen 1999, Reijnen and Foppen 1994). Birds are particularly sensitive to disruption, and species richness /abundance of birds has been shown to increase with an increasing distance from roads (Summers et al. 2011).

Forest fragmentation can also influence the availability of host species by allowing the range expansion of nest parasites (Hobson and Villard 1998). Brown-headed cowbirds thrive along forest edges and pose a major hazard to songbirds more than that posed by predation (Brittingham and Temple 1983). The frequency of parasitism can vary and increases as the area of open

habitat around the nest increases (Brittingham and Temple 1983). Cowbirds that breed in a forested community will feed in grassy openings such as roadsides (Thompson 1994). Cowbird parasitism is facilitated by the construction of roads especially if cowbird populations are abundant (Gates and Evans 1998) and abundance has been shown to be greater especially near paved roads with grassy shoulders (Rich et al. 1994).

Due to the concerns stated above, we recommend the following:

- Minimize any new road construction by upgrading and using existing infrastructure.
- Limit and minimize large grassy roadsides.

Threatened and Endangered Species

The Michigan Natural Features Inventory (MNFI) was reviewed prior to submission of the permit application, and multiple biological surveys were conducted in search of MNFI-listed plants and animals in the project area. Only the narrow-leaved gentian was noted in field surveys. An internal MNFI search (of specific sections containing the proposed roadbed) noted the narrow-leaved gentian could possibly occur in S13 (state land) and S24 T50N R29W and in S18 T50N R28W (also state land). Occurrences of Farwell's water milfoil were noted in S26 T50N R29W and S11 T49N R29W, and the common loon was observed in the Brocky Lake area, S7 T48N R28W. *Possible* locations were noted for Canada rice grass in S25, S35 & S36 T48N R29W; S18 (State land), S19 and S30 T48N R28W; and S2 T47N R29W. (The last observance of Canada rice grass was listed as 1936.) Despite the surveys not locating these other species, caution should be exercised in all future work in these areas.

Due to the concerns stated above, we recommend the following:

- Consult previous surveys (internal and external) and be observant and diligent in all phases of construction.

Invasive Species Spread

New roads serve as a conduit for the introduction and spread of invasive species (Spellerberg 1998, Trombulk and Frissell 2000, Gelbard and Belnap 2003, Watkins et al. 2003, Flory and Clay 2005). The plant communities adjacent to paved roads contain a greater richness and cover of exotic species than interior sites adjacent to forest roads (Gelbard and Belnap 2003) and may facilitate their colonization of the forest interior (Watkins et al. 2003). These exotic plants can potentially influence wildlife habitat by displacing native forage species and modifying habitat structure (Belcher and Wilson 1989, Trammell and Butler 1995, Olson 1999). Notably, the spread of serious invasive pests such as purple loosestrife and spotted knapweed has been linked to road systems (Wilcox 1989, Noss 1996).

Due to the concerns stated above, we recommend the following:

- All road side planting should be done with Michigan native grasses.
- Survey for and remove invasive/exotic noxious plants.

Road Stream Crossings

The proposed road would cross the Middle Branch of the Escanaba River, Second River, Brown Creek, Koops Creek, Voelkers Creek, Dead River, Wildcat Canyon Creek, Mulligan Creek, Yellow Dog River, and multiple smaller tributaries, wetland areas, and permanent and seasonal unnamed creeks. Measurements indicate that 25.81 acres of wetlands would be affected by CR 595, but none of the impacted wetlands are located on state land. Twenty two road crossings would be

constructed; however, 15 of these crossings already exist, so these would be improvements/replacements. The other crossings would be in areas where new sections of road would be built. In order to mitigate this impact, 48.41 acres of new wetlands would be created using a 1.5:1 or a 2.0:1 ratio depending on the wetland type lost.

Following are comments specific to stream crossings. We request the applicant schedule a meeting with DNR Fisheries and DEQ to discuss the road stream crossing information provided in the application.

> Application Section (Tab) 11 Sheet 7P and 14P; Section (Tab) 12, Sheet 7B and 9B: Crossings should be located at riffles to maintain stream stability. Several crossings are located on stream meanders, which are less stable than riffles.
> Appendix L, Table 1: Bankfull width measurements vary considerably at several crossings (e.g., Voelkers Creek ranges from 4.1 to 13.6 feet). This can significantly affect culvert sizing.
> Appendix L, Stream Data Sheets: Although the application includes sketches, photographs, and graphics that describe habitat features from which the bankfull, cross-section, and longitudinal profile measurements were made, the measurements require further discussion with DNR Fisheries, particularly relative to culvert and bridge sizing (i.e., development of bankfull shelf, bridge structures, etc.)
> Application Page 224, Table 9-1; Appendix L, Table 1: Stream crossing station identifiers (e.g., 1130+96) are inconsistent throughout the main application text and appendices. The identifiers need to be consistent throughout the application to ensure accurate references to the actual stream stations.
> Application Page 61, Section 4.05, fifth paragraph; Section (Tab) 6, Stream Crossing Schedule: The text explains specific design issues related to road alignments near wetlands and the Stream Crossing Schedule indicates relatively long culverts (e.g., 87 foot-long culvert at Wildcat Canyon Creek 1418+67). It is important to note that similar to culvert width (span), culvert length can significantly affect stream habitat connectivity.
> Application Page 226, Section 9.04; Appendix H: The application contains a plan for the East Branch Salmon Trout River, but does not discuss details such as storm water routing. This information needs to be included in the application.
> Application Page 89, Section 5.11; Page 223, Section 9.0: The application incorrectly regards the Methodology as "mitigation" for streams. The Methodology should not be considered "mitigation," as the Methodology is more of a common approach to stream crossing design. The application should be revised accordingly.

Due to the concerns stated above, we recommend the following:

- Culvert lengths should be reduced as much as possible to reduce stream habitat fragmentation.

Road Salt Impacts

Page 75, Section 5.02.C of the application states road salt impacts on streams can be mitigated by directing runoff away from streams. This is not necessarily true. Chloride is a conservative pollutant, meaning that once it is in the system, it can not be removed. Chloride is transported in surface and groundwater indefinitely, and its rate of transport is governed by watershed hydrology and in-stream hydraulics.

Road salt can also impact wildlife by damaging vegetation which degrades wildlife habitat by destroying food resources, habitat corridors, shelter, breeding or nesting sites and it can have behavioral and toxicological impacts (Forman and Alexander 1998, Wegner and Yaggi 2001).

Due to the concerns stated above, we recommend the following:

- Road salt impacts on streams are best mitigated by reducing road salt loads.
- Examine calcium magnesium acetate or potassium acetate as an alternative to road salt in deicing operations.

Previous DNR Fishery Survey Data and DEQ Survey Data

The following surveys should be included in the application (see application page 242, Section 12; King & MacGregor response to DNRE Fisheries Division comments dated March 5, 2010, page 3, Environmental Assessment section):

Koops Creek – 9/12/1991
Middle Branch Escanaba River – 9/4/1991 and 9/12/1991
Second River – 9/12/1991, 9/5/1995, 7/12/2000, and 8/5/2008 (only cited in reference list; not explained in text)

Thank you for the opportunity to provide input on this permit application.

Sincerely,

William E. Moritz, Ph.D.
Natural Resources Deputy Director
517-373-0046

cc: Mr. Bill Creal, DEQ
Mr. Jim Sygo, DEQ
Dr. Russ Mason, DNR
Mr. William O'Neill, DNR
Mr. James Dexter, DNR
Ms. Stacy Welling, DNR

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